

National Infrastructure Advisory Council (NIAC)

NIAC Chemical, Biological and Radiological Events and the Critical Infrastructure Workforce

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Overview

- ▣ Working Group Process Update
- ▣ Radiological Objective/Scope
- ▣ Key Questions
- ▣ Contributors
- ▣ Findings
- ▣ Recommendations

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Working Group Update

■ October NIAC:

- Present initial radiological findings and recommendations

■ January NIAC:

- Present final consolidated deliverable (including final chemical, biological, and radiological reports)

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Radiological Objective

- Provide recommendations for preparing those who work in and maintain areas considered Critical Infrastructure (CI) for a radiological event and ensure they have the tools, training, and equipment necessary to identify, respond to and recover from a radiological event.

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Key Questions

- ❑ Question #1: Do organizations have employee awareness, preparedness, and response training programs?
- ❑ Question #2: Is there a market incentive to invest in radiological preparedness and response programs?
- ❑ Question #3: Is there sufficient communication infrastructure in place to respond to a radiological event?

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Key Questions (cont.)

- ❑ Question #4: What tools and technologies currently support your radiological response capability?
- ❑ Question #5: Is there sufficient coordination between Federal, state, local, and private-sector entities?
- ❑ Question #6: What can the Federal government do to encourage or facilitate enhanced preparedness and response capabilities across and between the public and private sectors?

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Contributing Organizations

- ▣ Federal Bureau of Investigation
- ▣ Georgia Army National Guard
- ▣ Johns Hopkins University
- ▣ National Defense University
- ▣ Nuclear Energy Institute
- ▣ Texas A&M University
- ▣ University of Alabama, Birmingham

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Critical Sectors Represented

- ▣ Critical sectors represented in the Study Group included:
 - Chemical
 - Communications
 - Emergency Services
 - Energy
 - Financial Services
 - Food and Agriculture
 - Healthcare
 - Information Technology
 - Oil and Gas
 - Nuclear
 - Transportation
 - Water and Wastewater Management

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Scope and Findings

□ Scope

- Focused on low-yield, dispersal device, or dirty bomb scenario.
- Did not focus on traditional, nation-state, nuclear weapons attack.
- DHS concurrently studying/developing threat and vulnerability data to refine probability and impact scenarios.

□ Findings

- Planning and preparedness
- Communications
- Training and education
- Psychological effects
- National Council on Radiation Protection and Measurements (NCRP)
- National Defense University radiological event studies
- National Response Framework
- 9/11 Commission Recommendations
- TOPOFF 4

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Findings (cont.)

□ National Defense University radiological study results

□ Time is of the Essence

- Time sensitivity of information: accurate information will be needed quickly to save lives and manage fear.

□ They'll Look to the Feds

- State/Local participants will look to Federal Government for information on radiation effects.
- Responders want this information in advance and in field-useable form.

□ Identify the Experts

- Many participants did not know which Federal agency was principal repository of nuclear effects expertise.
- Also not clear to some participants which Federal officials are in charge of response.

□ Deal the Private Sector In

- A number of government participants, particularly at the state and local level, stressed need to solicit views of key private sector entities, e.g., utilities.

□ Psychological Impacts will Rival Physical Damage

- Radiation is scariest effect of nuclear attack or dirty bomb (i.e., RDD); radiation effects are least widely understood.
- Precedent of an initial terrorist attack will greatly heighten fears of future nuclear or RDD attacks.
- Fear will impose heavy burdens, especially on the worried well, residents of other cities, markets.
- Psychological impact of radiation will create other down-stream negative effects, including radiation-centric treatment of victims with trauma.

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Findings (cont.)

❑ Psychological effects of events (including radiological events) *

- ❑ Disasters may create significant impairment in 40-50% of those exposed.
- ❑ About 50% of disaster workers likely to develop significant distress.
- ❑ Terrorism likely to adversely impact majority of population; ranges ~40-90%.
- ❑ Dose response relationship with exposure; more psychological casualties than physical.

❑ Goiania, Brazil radiological accident, September 1987 **

- ❑ Exposed 100 grams of abandoned radiotherapy waste (cesium 137).
- ❑ Resulted in 4 deaths, 260 showing signs of exposure, 49 requiring medical treatment.
- ❑ Caused more than 112,000 people to seek treatment.
- ❑ Stress-induced symptoms mimicked radiation poisoning, including vomiting, blisters, burns, reddened skin, etc.
- ❑ Residents faced nationwide discrimination, e.g., inability to travel, secure hotel rooms.

*Dr. George S. Everly, Jr., Johns Hopkins Center for Public Health Preparedness ** Dr. Stephen M. Becker, "Emergency Communication and Information Issues In Terrorist Events Involving Radioactive Materials," Biosecurity and Bioterrorism: Biodefense strategy, practice and science, Volume 2, Number 3, 2004.

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Findings (cont.)

❑ National Council on Radiation Protection and Measures

❑ NCRP Report No. 138, "Management of Terrorist Events Involving Radioactive Material," October 2001 addresses

- Definition of a problem
- Roles and responsibilities
- Handling psychosocial impacts
- Medical issues of concern
- Allowable exposure
- Clean-up

❑ NCRP Commentary No. 19, "Key Elements of Preparing Emergency Responders for Nuclear and Radiological Terrorism," April 2006

- Equipment requirements for first responders; perimeter establishment and management
- Portable and stationary decontamination equipment and medical supplies
- Content and frequency of training for first responders; on-scene management

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Findings (cont.)

- ❑ National Council on Radiation Protection and Measures (NCRP)
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Findings (cont.)

- ❑ National Response Framework
- ❑ Issued by DHS for comment, September 10, 2007; 30-day comment period
- ❑ Objectives
 - Focus on response and short-term recovery.
 - Consider all-hazards scenarios, including chemical, biological, and radiological.
 - Inform responders and emergency managers; outline operating structures and tools.
- ❑ Radiological Annexes
 - Addresses multiple threat and vulnerabilities, including:
 - ❑ Radiological dispersal devices
 - ❑ Improvised nuclear devices
 - ❑ Nuclear facility accidents
 - ❑ Lost radioactive material
 - ❑ Transportation accidents; domestic and foreign nuclear weapons accidents
 - Provides planning and guidance, including operational concepts.
 - Specifies Federal roles and responsibilities.
 - Identifies protocols for communications, resource coordination, and notification.
 - Incorporates flexibility in response approaches, based on events.

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Findings (cont.)

□ Title V, Section 501, of the 9/11 Commission Act of 2007 - Strengthening the Security of Cargo Containers

- Permits a container to enter the United States, either directly or via a foreign port, only if the container is:
 - Scanned with equipment that meets standards established by the Secretary, including for the use of technology to scan for radiation, density, and atomic elements; and
 - Secured with a seal that meets standards established by the Secretary, including for the use of technology to detect and identify the time of any container breach.
- Encourages the Secretary to promote and establish international standards for container security with foreign governments and international organizations.

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Findings (cont.)

□ **TOPOFF 4; TOPOFF 3 results not broadly disseminated**

□ Overview

- Will test multiple radiological dispersal device scenarios
- October 15 – 19; Arizona, Oregon, and Guam; includes Canada, Australia, and UK
- Includes more than 15,000 participants

□ Objectives:

- Prevention: Test the handling and flow of operational and time-critical intelligence between agencies to prevent a terrorist attack
- Intelligence/investigation: Test the handling and flow of operational and time-critical intelligence between agencies prior to, and in response to, a linked terrorist incident
- Incident management: Test the full range of existing procedures for domestic incident management of a terrorist weapon of mass destruction event and to improve the top officials' capabilities to respond consistent with the NRP and NIMS
- Public Information: Practice the strategic coordination of media relations and public information in the context of a terrorist weapon of mass destruction event or incident of national significance.
- Evaluation: To identify lessons learned and promote best practices

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Findings (cont.)

■ Surveillance and Response

- Identified some deployments of surveillance and response technologies for first responders and those in proximity to likely event; large legacy radiological sensing capabilities from Cold War era; need to revisit refreshing technology platforms.
- Public education, media management and other public communications around surveillance and response that aren't highly mature.
- Toxic Exposure Surveillance System (TESS)
 - CDC with American Association of Poison Control Centers.
 - Objective: Real-time national surveillance and exposure database.
- National Incident Management System (NIMS)
 - DHS, FEMA
 - Objective: NIMS benefits include a unified incident management approach; standard command and management structures; and emphasizes preparedness, mutual aid, and resource management.
- Electronic sensor capabilities
 - Public sector: Several organizations across the country well-equipped; limitations on the distribution and penetration of those units.
 - Private sector: Limited pockets of capabilities within the private sector, including nuclear sector capabilities that could be tasked to support critical event response.
- Community Hazards Emergency-Response-Capability Assurance Process (CHER-CAP)
 - DHS, FEMA
 - Objective: Readiness, planning, preparedness, and response coordination.

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Findings (cont.)

■ Communications

- DHS Report (8 Dec 06) on incident response communications interoperability
 - 22,400 randomly selected police, fire, and EMS agencies.
 - Cross-jurisdiction interoperability outpacing Federal to state or state to local interoperability progress.
- SAFECOM
 - Established by DHS.
 - Provides research, development, testing and evaluation, guidance, tools, and templates on interoperable wireless emergency communications.
 - Office of Emergency Communications.
- WARN Act improvements to emergency communications
- FCC
 - Communications Security, Reliability, and Interoperability Council (CSRIC).
 - 9/11 Act: FCC vulnerability assessment of the Nation's critical communications and information systems infrastructure and evaluation of the technical feasibility of creating a back-up emergency communications system that complements existing communications resources.

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Nuclear Sector

❑ Nuclear Sector Coordinating Council (NSCC)

- Overarching private security entity for all phases of the Nuclear Cycle, and radioactive materials.
- Enabled by HSPD-7 and includes a counterpart Government Coordinating Council.
- Covers reactor operations, medical and industrial radio-isotopes, research and test reactors, spent fuel storage sites, transportation.

❑ Nuclear Sector possesses inherent strengths against RDD or other potential threats posed by ionizing radiation.

- Mature science and technology infrastructure and well established practices for working safely with radiation.
- 24 X 7 business, with robust security and health physics and radiation protection expertise and material controls.

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Nuclear Sector (cont.)

❑ Substantial work done to analyze radiological threats, including RDD threats, considering both prevention and response.

- Working with Industry and governmental organizations such as Health Physics Society, American Nuclear Society, National Council on Radiation Protection, Nuclear Energy Institute, Department of Energy, Nuclear Regulatory Commission.
- NCRP Report # 138 offers a comprehensive road map for managing most aspects of managing an RDD type event.
- A significant amount of work in understanding the public communications dimension of an RDD event has been completed.

❑ Regulatory oversight in all critical elements of the business.

❑ Deployable, trained, organized Emergency Response Infrastructure.

- All hazards approach to handling any emergent situation of varying degree of severity, including general radiological emergencies – Periodic training, drills and exercises, including jointly drilling with public sector first responders.

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Nuclear Sector (cont.)

▣ The nation could potentially:

- Develop and deploy training modules for all first responders by adapting existing industry training programs.
- Explore Memorandums of Understanding for private-sector expert resource sharing during an RDD emergency—private-sector expertise is resident in most US states.
- Leverage industry knowledge and experience in developing a credible communications strategy and assistance in tailoring messages for public release.

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Recommendations

▣ Planning, preparedness, and response:

- Complete the prioritization of comprehensive, national risk assessment (e.g., RAMCAP, NIPP, etc.) that prioritizes radiological threats and vulnerabilities within context of others (e.g., chemical, biological, etc.).
- Define roles and responsibilities for agencies that impact the transportation of, and accountability for, radiological materials:
 - Customs and Border Enforcement
 - Transportation Security Administration
 - Department of Transportation: railroads, trucking, and shipping
 - US Coast Guard – all navigable waters – MTSA regulations
 - Nuclear Regulatory Commission – nuclear facilities and materiel

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Recommendations (cont.)

□ Planning, preparedness, and response (cont.):

- Improve knowledge around specific scenarios, impact, and likelihood of events.
 - Assess usability/availability of planning data.
 - Continue to deploy tools to support planning and response scenarios.
 - Prioritize scenarios based on potential risk factors.
 - Collect detailed information to assess vulnerability.
 - Evaluate data against specific threat scenarios generated by DHS.
 - Fully understand threat and vulnerability risk factors and attendant response mechanisms.
 - Conduct, or sponsor, regional cross-sector assessments.
- Improve accessibility to planning and response material.
 - Develop and propagate standardized event response planning material.
 - Consider innovative planning and response content delivery, e.g., web-based delivery, emergency planning portals, etc.
 - Establish more robust, or more frequent, tabletop planning and response exercises.

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Recommendations (cont.)

□ Planning, preparedness, and response (cont.):

- Clearly define response roles, responsibilities, and communication protocols. Include as part of response exercises.
- Improve planning, preparedness, and response capabilities across first responders.
 - Improve accessibility and economic viability of necessary equipment.
 - Improve readiness of first responders, especially law enforcement and Fire/EMS to address radiological events.
 - Continue to staff and support Fusion Centers; better engage law enforcement in Fusion Centers.

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Recommendations (cont.)

▣ Surveillance and detection; tools and technologies:

- Improve information collection, analysis, and reporting mechanisms that support radiological event detection; define S&T roadmap on same.
- Continue to fund collaborative, public-private efforts to develop more advanced detection solutions:
 - Idaho National Lab
 - Lawrence Livermore National Lab
 - Argonne National Lab
 - Brookhaven National Lab
 - Los Alamos National Lab
- Accelerate deployment of tools/technologies under development; identify commercialization mechanisms making solutions more broadly available to public and private sector stakeholders.

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Recommendations (cont.)

▣ Communications:

- Continue to make progress with NIMS/NRF re-write:
 - Address national, state, local flow chart communications
 - More clearly define roles and responsibilities across all levels of government and the private sector
- Continue to make strategic improvements, including implementation of WARN Act and Safecom.
- Improve tactical event communications capabilities, specifically around first responder, private sector, and fire/EMS/law enforcement resources.

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Recommendations (cont.)

NDU Radiological Study Suggested:

- ❑ Early identification of impacts on key infrastructure, esp.
 - Communications, transportation, and power
- ❑ Understanding the government's capacity for response, esp.
 - Availability of response personnel and medical resources
- ❑ Knowing who is in charge of the response, esp.
 - What is the lead Federal agency and what is the chain of command?
- ❑ Receiving timely guidance on how to respond, esp.
 - Evacuation vs. shelter-in-place, triage, and movement from the "hot" zone to a clean zone
- ❑ Rapid delineation of radiation hazard zones, esp.
 - Perimeter and its variability, and whether responders can safely enter

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Recommendations (cont.)

NDU Study (cont.)

- ❑ **We found a great deal of information available on nuclear effects and response.***
 - We located over 130 published sources (and know there are many more).
 - Effects data mainly derived from Hiroshima/Nagasaki and U.S. above-ground testing.
 - Interestingly, a majority of sources we found on response post-date end of Cold War.
- ❑ **Information is not yet adequately adapted for contemporary responders' needs.**
 - We encountered a perception among response community that information is sparse.
 - Our state/local workshop participants emphasized need for at-hand, detailed, how-to guidance, especially regarding radiation effects and response roles/responsibilities.
 - Hurricane Katrina demonstrated shortcomings of national response plans generally.
 - But, important efforts are being made to address needs, e.g., DHS RDD/IND PAG.
- ❑ **Therefore, the most important response challenges appear to concern:**
 - Filling knowledge gaps for effects on "things" that post-date above-ground testing.
 - Making knowledge readily accessible and useable for contemporary responders.
 - Clarifying roles and responsibilities and improving mechanisms of cooperation.

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Questions?